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CULTURAL STUDIES ON CUCUMBERS FOR PROCESSING

1978

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Research on culture and physiology of cucumbers for processing was conducted at 2 locations--Main Campus, Wooster and Green Springs Crops Research Unit, Green Springs.

Soil at Wooster is a silt loam with good uniformity throughout the experimental area (pH-6.5-6.6). The plots received 700 lbs/A of 10-20-20 fertilizer after plowing but before final discing and fitting for planting. No additional fertilizer was added. Vegiben 2E at 2 lbs/A was used for weed control. A standard insecticide-fungicide program was used throughout the season and no serious weeds, insect, or diseases occurred.

Soil at the Green Springs Unit is a fine sandy loam and also uniform throughout the experimental area (pH-6.6-6.8). Pre-plant fertilizer treatment was 800 lbs/A of 6-24-24 except for the N-source study which received 800 lbs/A of 0-26-26 after plowing. Vegiben 2E at 2 lbs/A was used for weed control. Standard insecticide and fungicide practices were used and no problems of weeds, insects, or disease occurred.

Frequency and Thoroughness of Harvest Study - Wooster and Green Springs:

A hand-harvest study was conducted at both locations to determine: 1) the influence of picking at various time intervals on yield and gross returns; 2) the influence of leaving a few fruits on the vines (thoroughness) until they reach 2 inches in diameter, on yield and gross returns. Picking intervals were: 1) everyday; 2) 5 days per week (not picked on week-ends); 3) 3 days per week; 4) 2 days per week, 5) once a week. Thoroughness was: 1) pick all fruit of usable size at each picking; 2) leave 6 fruits per 30-ft. row until the fruits reached 2 inches in diameter and then pick and leave 6 more fruits to reach 2 inches, etc.(the fruits were tagged to prevent picking errors). Two varieties were used--Premier and Pioneer. Seeding was done at Green Springs on May 25 in rows on 30-inch centers. Plants were thinned to 6-inch spacings after emergence. Wooster plots were seeded on June 14 in 4-ft. rows and also thinned to 6-inch spacing of single plants. Harvest started on July 10 at Green Springs and continued for 6 weeks. Wooster harvest was from July 28 to September 1.

Fruits were graded into commercial sizes and 5 different values were used to calculate gross returns. Only one value will be given here: Size 1 - $280, Size 2 - $140, Size 3 - $70, and Size 4 - $10 per ton.

A more detailed greenhouse study was also conducted but these results will be published at a later date.

Results indicate, 1) as frequency of harvest increased, gross returns increased but total yield decreased (Table 1 and Fig. 1); 2) as frequency of harvest increased the percentages of sizes 1 and 2 increased and sizes 3 and 4 decreased (Fig. 2); 3) thorough picking resulted in higher gross returns (Table 2)

but lower total yield; 4) thorough picking decreased the yield of cull fruit from 5.71 to 4.97 tons per acre; 5) the two cultivars responded similarly to treatment although Pioneer averaged more cull fruits than Premier throughout the season.

More information on this study will be available in a later publication.

TABLE 1.--Influence of harvest frequency on gross returns of Pioneer and Premier pickling cucumbers, Green Springs 1978.

Cultivar	Harvest Frequency times/week	Gross Returns $ per acre
Pioneer	1	1,356
	2	2,052
	3	2,300
	5	2,565
Premier	1	1,534
	2	2,190
	3	2,331
	5	2,388

TABLE 2.--Influence of thoroughness of picking on gross returns of Pioneer and Premier pickling cucumbers, Green Springs 1978.

Cultivar	Thoroughness of picking	Gross Returns $ per acre
Pioneer	Fruit left	2,007
	All picked	2,130
Premier	Fruit left	1,994
	All picked	2,227

N-Source:

Studies were conducted at Green Springs in 1977 and 1978 to determine the influence of source of N in yield and gross returns. Sources were urea (45%), liquid N (28%), ammonium nitrate (33 1/3%), calcium nitrate (15 1/2%), ammonium sulfate (21%), and in 1978 only, a controlled release methylene urea (39%). All were applied preplant broadcast at rate of 60 lbs. N/A. Rows were on 30-inch spacings with single plants of Premier 6 inches apart. Plots were harvested at 3 or 4 day intervals for 7 harvests in 1977 and 8 in 1978. Values used to calculate gross returns: Size 1 - $240/ton; Size 2 - $120/ton; Size 3 - $60/ton; Size 4 - $10/ton.

Results summarized in Table 3 indicate no statistically significant effects of N source on yield and returns. However, there are sufficient indications that there may be some subtle effects and the study should be continued at least another

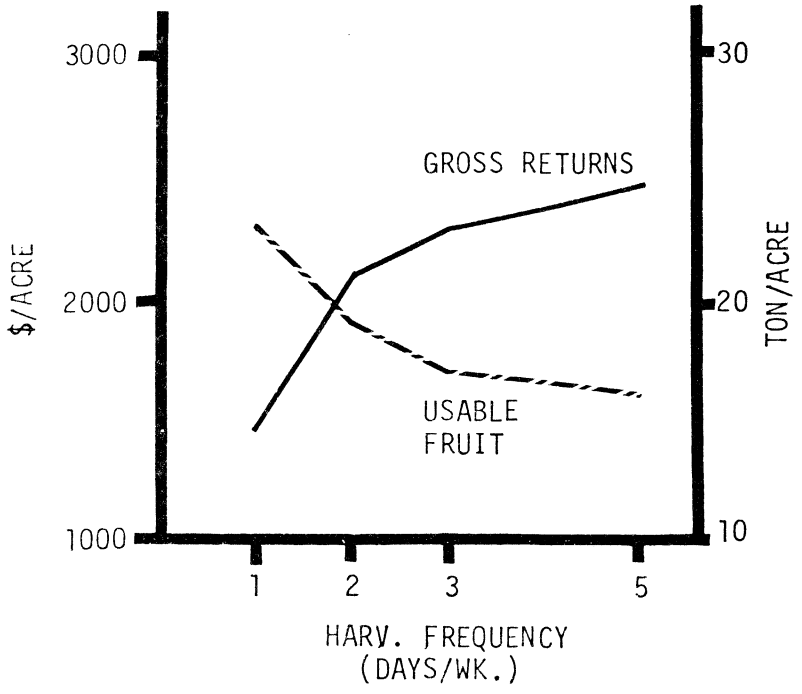

Fig. 1.--Influence of the frequency of harvest on gross returns and yield of pickling cucumbers.

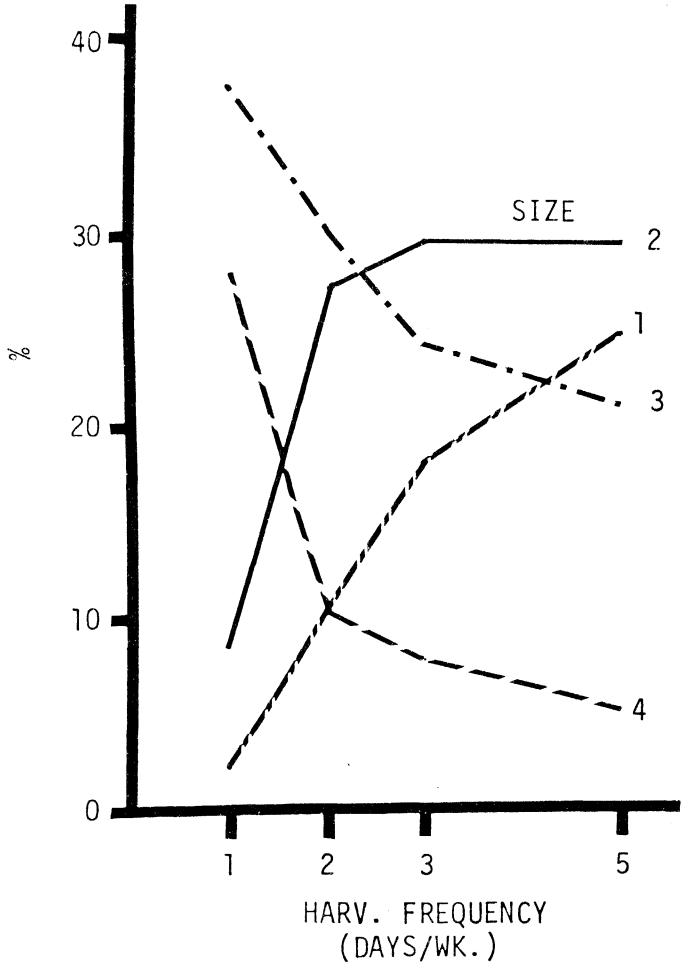

Fig. 2.--Influence of the frequency of harvest to size (grade) distribution of pickling cucumbers.

year. Data suggest that fruit length may be affected by source and perhaps internal quality may also be affected.

TABLE 3.--Influence of source of N on yield and returns from pickling cucumbers, Green Springs 1977 and 1978.

	Yield Tons/A				Yield $ /A			
	First Harvest		Total Yield		First Harvest		Total Yield	
N Source	1977	1978	1977	1978	1977	1978	1977	1978
Urea	2.75	3.05	12.33	13.32	152	161	1346	1350
Liquid N	2.73	2.64	11.34	13.39	136	165	1237	1369
Amm. Nitrate	1.94	3.34	10.86	12.75	135	176	1273	1287
Cal. Nitrate	2.04	3.26	12.46	13.63	136	188	1439	1414
Amm. Sulfate	2.25	4.15	13.54	14.32	143	191	1509	1345
Meth. Urea	----	3.93	-----	13.23	---	195	----	1324
LSD .05	NS	1.43	NS	NS	NS	NS	NS	NS

Fruit Set with Growth Regulators:

Previous data have suggested that chlorflurenol ("Curbiset") is effective in setting sucumbers without pollination. Results have also shown that culls (nubs and crooks) are also increased by treatment. However, if fruits are harvested when small, off-shaped fruit appears to be negligible. This treatment would be used only in a once-over machine harvest situation because the chemical effectively stops growth of the plants.

Trials in 1978 indicated that treatment of Pioneer cucumbers with chlorflurenol increased yield of Size 1 cucumbers 33 to 55% with little or no effect on larger sizes. The average increase in Size 1's was 1622 lbs. from untreated and 2076 lbs. per acre from treated plots. Culls were also increased by treatment but not as severe as other years because the plots were harvested with a much lower amount of Size 3 and no over-sized fruits as was done in previous years.

This may become a useful tool for Ohio growers who are mechanically harvesting pickling cucumbers and want to produce higher yields of smaller fruits on some of their acreage. The chemical is not yet labelled for general use on cucumbers.

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